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**Interim Targets Independent Expert Panel  
Energy, Environment and Climate Change  
Department of Environment, Land, Water and Planning  
Victorian Government  
PO Box 500  
East Melbourne VIC 8002**

**Submitted by email to the Secretariat: [anna.drutschinin@delwp.vic.gov.au](mailto:anna.drutschinin@delwp.vic.gov.au)**

**30 April 2018**

Dear Mr Combet AM, Dr Whetton and Dr Stephenson

**Victorian Independent Expert Panel Interim Emissions Reduction Targets, Issues Paper, March 2018**

AGL Energy (**AGL**) welcomes the opportunity to provide a submission to the Interim Targets Independent Expert Panel's (**Expert Panel**) that was appointed by the Victorian Government to advise on Victoria's interim emissions reduction targets for the periods 2021-25 and 2026-30, to set Victoria on a path to achieving net zero emissions by 2050. AGL notes the Expert Panel's Issues Paper that was released in March 2018.

As one of Australia's leading integrated energy companies and largest ASX listed owner, operator and investor in renewable generation, AGL is well placed to comment on the issues presented. AGL operates across the energy supply chain and has investments in base, peaking and intermediate generation plants, spread across traditional thermal generation as well as renewable sources. AGL is also a significant retailer of energy, providing energy solutions to over 3.5 million customers throughout eastern Australia.

AGL is committed to playing a leading role in developing a pathway to a modern, decarbonised energy sector. As our Greenhouse Gas Policy elaborates<sup>1</sup>, we have committed to a range of measures that will drive the decarbonisation of Australia's energy sector, including the closure of all of our existing coal-fired power stations by 2050 and continued investment in new renewable and near-zero emissions technologies. Through our Transition Project, we are also seeking to play a leading role in a just transition of the energy sector, consistent with Australia's commitment under in the Paris Agreement.<sup>2</sup>

Nevertheless, we consider that the projected current and future impacts of climate change are inextricably linked to the design of Australia's energy and climate policies. The Australian economy cannot effect a low-carbon transition in isolation of government and public policy settings. Policy should reflect the transitional nature of the issue and for the energy sector, recognise the essential service nature of electricity.

Whilst AGL supports in principle Victoria's setting of interim emissions reduction targets, we consider that the trajectory of any State-based emissions targets impacting upon the energy sector need to be appropriately coordinated with the National Electricity Market (**NEM**) participant States. In this regard,

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<sup>1</sup> For further information see [https://content.agl.com.au/wpcontent/uploads/2017/04/AGL\\_Greenhouse\\_Gas\\_Policy.pdf](https://content.agl.com.au/wpcontent/uploads/2017/04/AGL_Greenhouse_Gas_Policy.pdf).

<sup>2</sup> See Paris Agreement recital, 'Taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities'; See further <https://www.agl.com.au/-/media/AGL/About-AGL/Documents/Media-Center/ASX-and-Media-Releases/2017/170810-AGL-rehabilitation-report.pdf?la=en>.



consideration should be given to the national policy debate regarding the design of the National Energy Guarantee (**Guarantee**) and its implementation by State jurisdictions. AGL would urge the Victorian Government to align its interim emissions reduction targets with a national reference point. Should the Victorian Government look to set interim targets at a level of ambition that exceeds the Commonwealth's current goal, we would urge careful consideration of the kinds of policy mechanisms that may be required and their interaction with current and proposed national policy settings. AGL is supportive of the use of an emissions budget as a tool for the Panel's analysis and agrees with the merits of using a carbon budget.

AGL would also urge the Victoria Government to tailor the trajectory of its interim emissions reduction targets to Victoria's particular economic and social circumstances, to ensure the State's ongoing energy security and continued economic prosperity. In terms of the scale of the Victoria's interim targets, AGL notes the risk that Victoria may face severe and disproportionate reductions should it seek to pursue the same rate of decline as other states, given the nature of its energy assets. To ensure that Victoria is not economically disadvantaged, policymakers would need to carefully consider alternative sources of firm generation and the level of investment or incentive that may be required. Alternatively, it may be the case that a more nuanced emissions trajectory is more appropriate in the Victorian context.

In AGL's view, there are substantial opportunities to address emissions reduction in the energy sector through the development and deployment of low-emissions technologies and business models both at the industry scale, and through distributed energy resources (**DER**) at the customer end. Through electrification we also anticipate substantial opportunities to reduce greenhouse gas emissions in Victoria's transport sector, whilst improving the efficient use of infrastructure and delivering value for Australian homes and businesses.

While AGL anticipates a role for carbon offsets in Australia's emissions reduction efforts, we believe that their role should be limited, particularly in the context of the energy sector, so as to ensure that the structural decarbonisation of the Australian economy is not deferred.

To support the Expert Panel's deliberations, we elaborate our considered views in the Attachment to this submission, addressing the following matters in particular:

1. AGL's approach to the decarbonisation of Australia's energy sector;
2. Key considerations in designing State-based emissions reduction targets and trajectories for Victoria; and
3. Emissions reduction opportunities in Victoria.

Should you have any questions in relation to this submission, please contact Kurt Winter, Manager, Policy and Research, on 03 8633 7204 or myself on 02 9921 2516.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Tim Nelson'.

**Dr Tim Nelson**

Chief Economist



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## ATTACHMENT

### 1. AGL's approach to decarbonising Australia's energy sector

AGL accepts the Intergovernmental Panel on Climate Change (IPCC) conclusion that the risks associated with climate change are reduced substantially if warming is limited to less than 2 degrees Celsius above pre-industrial levels. Achieving this outcome would require complete decarbonisation of the world economy by 2100 and emission reductions of up to 70 percent by 2050.

Beyond the projected physical impacts of climate change, AGL has also given serious consideration to the transitional risks and opportunities associated with the transition towards a low-carbon economy. We believe that decarbonisation is a fundamental imperative that will drive the future of energy generation in Australia.

The electricity sector has an important role to play in meeting Australia's emission reduction targets and its long-term commitments under the Paris Agreement. Whilst electricity generation currently accounts for approximately one third of Australia's greenhouse gas emissions inventory and represents the single largest source of domestic emissions, technological substitutes to fossil fuels are available and increasingly cost effective. Electricity generation also has the potential to facilitate emission reduction in other sectors, notably transport with electrification powered by renewable energy.

AGL is committed to playing a leading role in developing a pathway to a modern, decarbonised generation sector. As our Greenhouse Gas Policy<sup>3</sup> elaborates, we have made a strong commitment to a range of measures that will drive the decarbonisation of the energy sector, including the closure of all of our existing coal-fired power stations by 2050 and continued investment in new renewable and near-zero emissions technologies. This policy underpins a multifaceted approach to climate change and its associated risks.

A clear example of the impact of this strategy and as a result of the policy is to place clear time limits on the operation of our fossil fuel plants, providing certainty to communities and the market as to our decarbonisation pathway. We refer to our Rehabilitation Report<sup>4</sup>, which was released to the market in August 2017. Our Rehabilitation Report details our closure timeframes for our fossil fuel plants as well as our approach to the rehabilitation of these assets.

AGL is also seeking to play a leading role in a just transition of the energy sector and has embarked upon its decarbonisation journey with a long term strategic intent – this is a transition that must be inclusive of all. As our Rehabilitation Report elaborates, the transition, absent the implementation of alternative futures, is likely to have concentrated impacts on those communities where coal fired power stations and related mining activities are based. Indeed, the economy of the Latrobe region of Victoria was founded and developed on the back of coal fired generation. We are working constructively with businesses in the Latrobe Valley region to drive innovation in the energy sector and, where possible, support the development of alternative industries to foster economic diversification and resilience. These activities are part of AGL's contribution to the economic leadership required in any successful transition. We are committed to working with stakeholders to connect rehabilitation priorities with emerging technologies and industries, enabling the best pre-conditions for future growth, diversification, and regional prosperity.

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<sup>3</sup> See AGL Greenhouse Gas Policy, Available at [https://content.agl.com.au/wp-content/uploads/2017/04/AGL\\_Greenhouse\\_Gas\\_Policy.pdf](https://content.agl.com.au/wp-content/uploads/2017/04/AGL_Greenhouse_Gas_Policy.pdf)

<sup>4</sup> See further <https://www.agl.com.au/-/media/AGL/About-AGL/Documents/Media-Center/ASX-and-Media-Releases/2017/170810-AGL-rehabilitation-report.pdf?1a=en>.



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In August 2016, AGL also released to the market its report "Carbon Constrained Future"<sup>5</sup>, which provides an economic analysis of AGL's operations within a carbon constrained future. Utilising PLEXOS modelling software, three scenarios of the NEM are presented: no carbon constraint; a carbon constraint that provides a linear pathway from emissions in 2016 to a 26-28% reduction in 2030; and an emissions constraint that represents a carbon budget consistent with limiting climate change to 2 degrees above pre-industrial levels. The purpose of this analysis is to demonstrate the sustainability of AGL's generation fleet in a carbon constrained future across a range of scenarios.

The modelling shows that AGL's power stations are likely to maintain much of their value in the shift to a carbon constrained world due to their relative low-cost and high efficiency, when compared to their peers. While the modelling is subject to significant uncertainty given the decadal timeframes involved, it is instructive for demonstrating the robustness of AGL's assets across a range of potential outcomes.

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<sup>5</sup> See AGL, *Carbon Constrained Future: AGL's approach to climate change mitigation: a scenario analysis* (2016), Available at [http://agl2016.sustainability-report.com.au/files/carbon\\_constrained\\_future.pdf](http://agl2016.sustainability-report.com.au/files/carbon_constrained_future.pdf).

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## 2. Key considerations in designing State-based emissions reduction targets and trajectories for Victoria

### The desirability of long-term nationally consistent public policy

For the electricity sector, with long investment horizons and large upfront costs, well telegraphed and consistent policy that provides insight into the investment environment over the long term is a pre-requisite to minimise the impact of emission reductions on Australia's economy and consumers into the future.

As AGL advocated to the Federal Government's 2017 Climate Policy Review<sup>6</sup>, this would be best supported by:

- Articulation of a long-term national target beyond 2030 supported by well telegraphed and consistent policy that provides insight into the investment environment over the long term;
- A long term, national carbon budget for Australia that extends to 2050 to underpin climate policy. Such a budget would allow businesses some insight into the suitability of investments with long lifespans; and
- A plan for the orderly decarbonisation and modernisation of the electricity generation system, including:
  - policy facilitating the progressive, orderly closure of older, emissions-intensive power stations;
  - introduction of an emissions intensity trading scheme as a cost-effective way to support low-cost abatement at all operating fossil fuel plants; and
  - ensuring additional renewable generation beyond the current Renewable Energy Target includes a requirement for dispatchability to support new intermittent generation.

### The projected impact of State-based targets

Whilst the fulfillment of Australia's emissions commitments under the Paris Agreement ultimately rest with the Commonwealth, in AGL's view, carbon constraints could also be effectively set at the State level to achieve the same long-term emissions target. Economic and social considerations may, however, support the establishment of varying State emissions trajectories, though nevertheless consistent in their long-term target (net zero emissions by 2050).

In AGL's assessment of the energy sector, we have observed that because current physical generation assets vary between each NEM region, the *relative* impact of State-based carbon constrains is likely to vary considerably between NEM regions. In particular, if Victoria were to seek to achieve the same *rate of decline* in emissions reduction in energy as in other States, AGL estimates that more severe and disproportionate reductions in emissions would be required. Such a trajectory would likely impact the level of "firm" or dispatchable energy available within Victoria in a disproportionate manner, with implications for energy security at the physical and financial or contractual level. Accordingly, to ensure that Victoria is not economically disadvantaged, policymakers would need to carefully consider alternative sources of firm generation and the level of investment or incentive that may be required.

AGL also observes that there are a number of 'real world constraints' in the energy sector which should be carefully considered in setting an appropriate emissions trajectory for Victoria. As noted in our Rehabilitation Report, AGL is committed to a transition of the energy sector that is inclusive of all. In Victoria, coal fired generation has been the hallmark of the economy of the Latrobe valley. The transition, absent the

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<sup>6</sup> See AGL, Submission to the 2017 Climate Policy Review, Available at <http://aglblog.com.au/2017/05/agl-submission-to-the-2017-climate-policy-review/>.



implementation of alternative futures, is likely to have concentrated impacts on those communities where coal fired power stations and related mining activities are based. Setting an emission trajectory with a strictly linear rate of decline may also impact the availability of affordable and competitively priced energy such that Victoria risks damaging its competitive advantage vis-à-vis other States in attracting and retaining business and ensuring the State's continued economic prosperity. These considerations may mean that a more nuanced emissions trajectory is appropriate in the Victorian context.

### **Implications for the design of Victoria's interim emission reduction targets**

AGL considers that the trajectory of any State-based emissions targets impacting upon the energy sector need to be appropriately coordinated with the National Electricity Market (**NEM**) participant States. As noted above, long-term nationally consistent policy is the most desirable policy outcome for the energy sector, given the long-term investment horizons and large upfront costs involved.

Nationally coordinated targets would also ameliorate some of the economic risks associated with setting emissions reductions targets at the State level. Nationally consistent short and medium-term goals would reduce States' exposure to competitive disadvantage for setting more ambitious emissions trajectories. In the context of the energy sector, it would also help to overcome some of the barriers to exit of incumbent plant.

Careful consideration should also be given to the way in which Victoria's State-based targets and any underpinning mechanisms would interact with national policy mechanisms. In particular, consideration should be given to the current national policy debate regarding the design of the Guarantee and its implementation by State jurisdictions.

Having regard to these considerations, AGL would urge the Victorian Government to align its interim emissions reduction targets with a national reference point. AGL accepts the science on climate change and considers that Australia's long-term mitigation efforts need to achieve net zero emissions by 2050, consistent with the Paris Agreement. In light of the longer-term global policy trajectory, we acknowledge the desirability of setting state interim emissions targets at a more ambitious level than the Commonwealth's current target. While Australia has communicated a nationally determined contribution (**NDC**) to reduce emissions to 26-28 % on 2005 levels by 2030, we appreciate that the Paris Agreement includes a requirement that parties ratchet up their ambition. At a fundamental level, Australia's public policy settings therefore need to establish a durable pathway to meet its current NDC targets and potentially ratchet up ambition over time.

Should the Victorian Government look to set interim targets at a level of ambition that exceeds the Commonwealth's current goal, we would urge careful consideration of the kinds of policy mechanisms that may be required and their interaction with current and proposed national policy settings. While more ambitious targets may be more desirable in the longer-term, AGL considers that target-setting cannot be considered in isolation from the establishment of effective policy mechanisms to drive the decarbonisation of Australia's economy. Indeed, as the Climate Change Authority (**CCA**) observed in its 2015 report, 'the costs of achieving particular targets (including their adverse impacts in particular industries) are best considered in the design of appropriate policy instruments, rather than through the acceptance of inadequate national targets.'<sup>7</sup> Accordingly, AGL continues to advocate for the design of effective national policy mechanisms both

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<sup>7</sup> See Climate Change Authority (2 July 2015), *Final Report of Australia's Future Emissions Reduction Targets*, Available at <http://climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/Final-report-Australias-future-emissions-reduction-targets.pdf>.



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in the context of the energy sector and the broader Australian economy. AGL considers that a well designed National Energy Guarantee could assist in replacing aging firm generation with low-emissions technology and complementary infrastructure at lowest cost. We also consider that instruments such as the national Safeguard Mechanism may have an important role to play in facilitating the decarbonisation of other sectors of the Australian economy.<sup>8</sup>

AGL is supportive of the use of an emissions budget as a tool for the Panel's analysis and agrees with the merits of using a carbon budget, as outlined in the Issues Paper. These include linking Victoria's total emission to climate science and the global goals articulated in the Paris Agreement and to highlight trade-offs between short- and long-term action to reduce emissions. In preparing AGL's own economic analysis of our operations within a carbon constrained future, we utilised the carbon budget expert advice provided by the CCA in 2013, which projected a national budget of 10.1 Gt CO<sub>2</sub>-e for the period 2013 to 2050. We would encourage the Panel to also draw upon the CCA's analysis to derive a Victorian budget. We would suggest that Victoria's share could for example be calculated based on Victoria's share of national Gross State Product in absolute terms. We consider this to be a more equitable approach given the relationship between Victoria's more emissions intensive energy assets and economic productivity.

In terms of the relative advantages and disadvantages of early versus late action to reduce Victoria's emission, we refer to our observations above on the projected impacts of State-based targets. In the context of the energy sector, if Victoria were to seek to achieve the same *rate of decline* in emissions reduction in energy as in other States, AGL estimates that more severe and disproportionate reductions in emissions would be required. The Victorian Government should also carefully consider the 'real world constraints' in terms of the concentrated impacts on those communities where coal fired power stations and related mining activities are based and the flow on effects in terms of the availability of affordable and competitively priced energy. Unless these challenges are able to be managed through a suite of complementary policy measures, it may be the case that a more nuanced emissions trajectory is more appropriate in the Victorian context, for example a less ambitious trajectory to 2030 that subsequently ramps up beyond that time.

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<sup>8</sup> See further AGL, Submission to the Emissions Reduction Fund, Safeguard Mechanism Consultation Paper (February 2018), Available at [http://aglblog.com.au/wp-content/uploads/2018/03/AGL-submission\\_Safeguard-Mechanism\\_Consultation\\_2018\\_FINAL.pdf](http://aglblog.com.au/wp-content/uploads/2018/03/AGL-submission_Safeguard-Mechanism_Consultation_2018_FINAL.pdf).



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### 3. Emissions reduction opportunities in Victoria

#### a. Opportunities in the energy sector

In AGL's view, there are substantial unrealised opportunities to address emissions reduction in the energy sector through the development and deployment of low-emissions technologies and business models both at the industry scale, and through distributed energy resources (**DER**) at the customer end. Public policy settings at both the Victorian and Federal level can play a key role in advancing Australia's energy market transformation by supporting the interaction of these new technologies and business models with Australia's electricity grid.

AGL has given considerable thought to the future of energy in Australia and believes that two fundamental imperatives will drive the future of the energy sector in Australia: decarbonisation and the centrality of customers' unique preferences and expectations.

More than 80% of electricity generated in Australia is sourced from the combustion of fossil fuels, the majority of which is provided by coal-fired generation. The transition to a decarbonised and modernised generation sector requires large scale investment, much of which will be less than half way through its asset life at the end of the current Renewable Energy Target (**RET**) scheme and Government's current 26-28% target under the Paris Agreement.

Investment will be best supported by emissions reduction policy that provides macro level certainty as to the timeframe and operating life of incumbent plant and reduced levels of uncertainty as to the market environment within which current investments will operate in post 2030. Greater certainty in these areas will support a more efficient transition, guiding decisions on new investments, management of existing capital stock, policy development, community transition and energy market development.

Integrated policies are required to ensure that these objectives can be jointly pursued over time. As the decarbonisation and modernisation of the electricity sector will span several decades, a long-term vision and trajectory for this transition is essential to provide investors with confidence to develop the long-lived and often capital intensive projects that will enable Australia to reduce its emissions efficiently over time, and at least cost.

Customers are also playing an important role in the energy market transformation, driving a shift away from the traditional linear electricity supply chain, to a more decentralised and bi-directional market. In addition to one in four households across Australia with installed solar PV, a proliferation of more DER (digital metering, smart inverters, energy storage, energy management systems, household appliance with smart controls etc.) are now entering the consumer market. These distributed technologies offer new opportunities for customers to actively manage their energy use and to share in value beyond the home – whether by 'sharing' energy with peers or participating in programs which support the operation of the network or the wholesale market. These developments are affecting grid utilisation and fundamentally changing the way in which consumers interact with the electricity grid.

AGL anticipates that the needs of the wholesale energy market will increasingly be supplied through a proliferation of DER, and the extent of the uptake and utilisation of DER may affect the role of large scale assets within future markets. Accordingly, the wholesale market will increasingly need to accommodate a diverse portfolio of decentralised low-emissions generation assets, which may affect the development of industry scale investments as well as the accessibility of supportive ancillary services.



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More broadly, AGL believes that the future of the grid will be as a gateway to multiple competitive platforms that enable a range of markets for customers. The distribution network will increasingly become the platform across which customers expect to be able to connect and transact. Rather than simply enabling the consumption of electricity delivered from centralised plant, the grid will have an increasingly important role facilitating a range of other service markets. These include markets for grid stability services (frequency and voltage), markets for services which support the network in constraint conditions, markets for wholesale demand response at times of tight supply, and 'peer-to-peer' energy trading.

In our view, there will not be a single business or delivery model to enable these mixed interactions and respond to the broad spectrum of customer needs and preferences. Reflective of the heterogeneity of customer needs and preferences, AGL expects product and service offerings from a broad mix of energy service providers to be similarly heterogeneous. The grid should provide a two-way energy platform upon which competing energy service providers can build their product and service offerings. The distributed energy ecosystem of the future may involve multiple distributed markets and service platforms co-existing and interacting. Energy service providers will invest, test, learn and innovate their offerings, and bear the risks and rewards associated with these endeavours.

AGL sees competition and innovation in technology and business models as the primary means for meeting this challenge and aligning the interests of energy service providers with those of the customers they serve. To enable efficient 'value stacking' requires the need for (location, size) of grid support services and their value to the network to be made explicit, so that products and services can be designed by competing energy service providers to address these and build those values into the commercial model.

One of AGL's strategic objectives is to become an orchestrator of large and small assets. This is in recognition of the current transformation of the energy industry from the traditional centralised generation model to a more distributed and integrated energy supply chain. In our view, orchestration would enable customers to realise the full value of their DER. By modifying the overall volume and shape of demand, DER can be deployed and operated to avoid or delay more expensive augmentations to the network. Further, smart inverters and local sensing devices can enable the provision of voltage and frequency services back to the distribution network and is an associated benefit of DER.

AGL is embracing innovation in behind-the-meter technologies, partnering with government and peers in the energy sector.

AGL's virtual power plant (**AGL's VPP**), co-funded with the Australian Renewable Energy Agency (**ARENA**), seeks to demonstrate the value that grid-connected batteries can create for a range of stakeholders when managed as part of a coordinated virtual power plant. Once complete, AGL's VPP will include 1,000 smart, connected batteries installed behind-the-meter, with a combined nameplate output of 5 MW and an energy storage capacity of more than 9.8 MWh. The project seeks to enable the 'stacking' of multiple values and demonstrates at a commercial scale the value that distributed energy technologies (solar and batteries in particular) can provide. Importantly, all grid users stand to benefit from such an arrangement through the reduced spending on network infrastructure and improved grid stability.

AGL's VPP was featured in the final Finkel Blueprint as a case study for the effective orchestration of solar and storage to provide multiple services in Australia's evolving energy system. We also presented AGL's VPP to the Commonwealth Standing Committee on the Environment and Energy in the context of its Inquiry into modernising Australia's electricity grid.



AGL has also engaged in a range of other innovative initiatives, including:

- Energy Insights: Culminating in January 2018, AGL's 'Energy Insights' trial was successful in highlighting the potential for customers to eliminate waste and save money by turning appliances off rather than leaving them on stand-by mode. Using innovative technology which allowed AGL to analyse meter data and produce details of energy use by appliance categories, AGL was able to provide customer with tailored Energy Insights reports.
- Solar energy trading technology: To improve our customers' energy experience, we have been investigating ways that customers can derive more value from distributed energy resources, including solar panels and battery storage. In May 2017, we led a project to investigate how 'blockchain' technology could be used to enable households with solar panels, batteries and 'smart' air conditioning to trade or share the excess electricity they generate.
- Solar Smart Plan: We were the first major Australian electricity retailer to launch a solar power purchase agreement (PPA) offer in February 2015: the Solar Smart Plan. Under this plan, customers buy their power from a solar system which is installed on their roof and owned and maintained by AGL for a fixed term. The Solar Smart Plan has been key to our solar customer growth, especially in the commercial and industrial customer segment.
- Virtual Solar: AGL recognises that home ownership and access to capital (i.e. funds to purchase the technologies) are barriers to equitable adoption of solar and battery storage. With this in mind, AGL has launched an innovative product to its customers who would like the benefits of solar power but cannot install solar panels on their rooves. Customers can subscribe to receive credits from AGL's solar generation, which can be used to decrease costs on their electricity bills.
- AGL Solar Command: We developed AGL Solar Command in FY15 to enable monitoring of production from customers' systems. This subscription service can identify potential performance problems and help optimise solar energy generation, savings and energy use. In FY16, this monitoring was made accessible via the AGL Energy App, allowing our customers even greater insight into their energy usage. AGL Solar Command Check was also launched in FY17 (and made available to customer from mid-July 2017). This is a free service, that will enable customers with Active Stream digital meters to receive regular health check status updates giving guidance on the working efficiency of their solar systems.
- Business energy services: AGL offers a range of energy efficiency services designed to help businesses of all sizes reduce energy costs. Our specialists work with business customers to understand their requirements and budget, and design and deliver custom, engineered solutions with professionally project-managed installation. Product and service options include solar PV system installations lowering daytime energy costs, energy efficient LED lighting upgrades to reduce energy consumption, and the use of power factor correction technology to reduce peak power demand.
- Electric vehicles (EVs): AGL wants to improve access to EVs in Australia, by removing the obstacles to ownership and enhancing the ownership experience. Our Electric Car Plan allows customers to charge their electric car, whenever they like and as often as they like for \$1 per day. As part of our Electric Car Plan, we also offset emissions associated with our customers' EVs at home through our Future Forests Program. AGL is a member of the Electric Vehicle Council, that was launched in May 2017. We have also committed to transitioning 10 per cent of AGL's business vehicle fleet to EVs by mid-2018. AGL will



also be trialling remote EV management during peak events for a number of AGL EVs in New South Wales (NSW) through our Managed for You program.<sup>9</sup>

AGL is committed to helping to shape a sustainable energy future. We believe that energy policy reform should focus on enabling transformation, driving productivity and unlocking growth. These objectives will be best supported by the following four core policy pillars:

- 1. Driving customer centricity and choice:** public policy settings should enable customers to embed themselves within the broader energy ecosystem and act as participants in multifaceted energy communities such as virtual power plants, energy sharing programs & intelligent micro-grids and communities.
- 2. Promoting competitive platforms and innovation:** Competition and innovation in technology and business models are the primary means for allying the interests of energy service providers with those of the customers they serve.
- 3. Ensuring power system security and reliability:** public policy should continue to drive the decarbonisation and modernisation of the power system to support adaptive and module low-emissions generation and related ancillary service markets.
- 4. Integrating energy and emissions reduction:** Long-term certainty on policy that integrates energy and climate change is needed to facilitate the smooth decarbonisation and modernisation of the energy sector.

AGL's approach to public policy is also guided by the following principles to ensure the sector's smooth transition and ongoing delivery of secure, affordable and sustainable energy into the future:

- where feasible, using **competitive markets** to deliver and value energy services;
- establishing policy, regulatory and market frameworks that are **technology neutral**;
- establishing appropriate **technology standards** that do not contradict broader policy objectives and are based, where possible, on international standards that encourage investments, ensure Australia keeps up with improving efficiencies and global best practices, promote customer choice, support competition, and encourage economies of scale;
- utilising **price signals** to encourage efficient investment and operational decisions; - allocating risks to parties that are best able to manage them;
- introducing **regulation only where necessary** to address a market failure, including to ensure system safety, security and reliability.
- Ensuring **an equal playing field** where different providers of products and services, in markets, must compete openly on their merits.
- A customer protections framework that ensures all customers have the **basic right to access energy**.

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<sup>9</sup> See further AGL's Managed for You program at <https://aglsolar.com.au/managedforyou/>. For further information about the national initiative see Dan Silkstone, 'Keeping the lights on in NSW, one smart meter at a time' (16 October 2017), Available at <https://arena.gov.au/blog/demand-response-agl/>.



- Ensure a framework that is **inclusive of all customers** including vulnerable customers the opportunity to participate and benefit from the energy market transformation.

Keeping these principles as a guidepost improves the predictability of modifications to existing regulatory and market frameworks when it becomes evident they are required. Open competitive markets and technology neutrality provide business with the impetus and latitude to pursue technology and service delivery innovations that meet system needs at efficient cost. We are already seeing evidence that holding to these principles promotes opportunities for addressing system impacts emerging from one set of technology innovations with technology innovations occurring elsewhere.

### **Opportunities in the transport sector**

As we elaborated in our recent submissions to the Victorian Parliamentary Inquiry into Electric Vehicles<sup>10</sup> and to Infrastructure Victoria on automated and zero vehicle emissions infrastructure,<sup>11</sup> through electrification we also anticipate substantial opportunities to reduce greenhouse gas emissions in Victoria's transport sector, whilst improving the efficient use of infrastructure and delivering value for Australian homes and businesses.

AGL is invested in the development of the Australian EV market through our Electric Car Plan, which allows customers to charge their electric car, whenever they like and as often as they like for \$1 per day. As part of our Electric Car Plan, we also offset emissions associated with our customers' EVs at home through our Future Forests Program. AGL is a member of the Electric Vehicle Council, that was launched in May 2017. We have also committed to transitioning 10 per cent of AGL's business vehicle fleet to EVs by mid-2018.

AGL also recognises the important relationship between vehicle electrification, automation and widespread shared mobility. Measures which support these three developments will have a synergistic effect in terms of their anticipated benefits. Indeed, as recent analysis from the Institute for Transportation and Development Policy and UC Davis<sup>12</sup> highlights, coordinated policy action on each of these fronts would ensure the best opportunities to decarbonise energy use, improve road safety and reduce transport costs for households whilst managing the risk of increased transport congestion and urban sprawl. Accordingly, AGL continues to work with the Australian Driverless Vehicle Initiative<sup>13</sup> and a variety of stakeholders to advance connected electric autonomous vehicle adoption.

The widespread uptake of electric vehicles, when coupled with the decarbonisation of the electricity grid, presents a substantial opportunity to deliver emissions reductions consistent with Australia's long-term commitments under the Paris Agreement. The increased uptake of electric vehicles also has the potential to contribute towards improved air quality, delivering significant health benefits to communities, particularly in metropolitan areas of Victoria. These benefits stem from the fact that electric vehicles emit zero tailpipe emissions.

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<sup>10</sup> See AGL, Submission to the Victorian Parliamentary Inquiry into Electric Vehicles (11 December 2017), Available at <http://aglblog.com.au/2017/12/submission-to-the-victorian-parliamentary-inquiry-into-electric-vehicles-2017/>.

<sup>11</sup> See AGL, Submission to Infrastructure Victoria on automated and zero emission vehicle infrastructure (7 March 2018), Available at <http://aglblog.com.au/2018/03/submission-to-infrastructure-victoria-on-automated-and-zero-emission-vehicle-infrastructure/>.

<sup>12</sup> Institute for Transportation and Development Policy and UC Davis Sustainable Transportation Energy Pathways of the Institute of Transportation Studies, (2017) *Three Revolutions in Urban Transportation*. Available at <https://www.itdp.org/publication/3rs-in-urban-transport/>.

<sup>13</sup> Australian Driverless Vehicle Initiative, *About the Australian Driverless Vehicle Initiative*, Available at <http://advi.org.au/australia/>.

Whilst Australia has a range of current climate policies in place which address the electricity sector, there is currently a complete absence of policy to address emissions from the transport sector, underlining the urgent need for policy reform.

AGL believes that the costs of decarbonisation should be shared equitably across the Australian economy. Indeed, any failure to address emissions from the transport sector will increase the burden for other sectors, including the energy sector which has already committed to a significant transition program.

The research undertaken by the Victorian Government for its Electric Vehicle Trial in 2012 remains illustrative of the interrelationship between EV energy economy and electricity grid emissions. We refer the Expert Panel to the report, *Victorian Electric Vehicle Trial: Environmental Impacts of Electric Vehicles in Victoria (EV Trial Report)*. Key findings in the EV Trial Report included that:

- the impacts from vehicle operation far outweigh those from vehicle production. That is true even where modelling allows for an EV battery replacement over the vehicle life. Vehicle disposal impacts, including those of the EV battery, were found to be negligible due to the expected high rate of material recycling;
- the dominant influence of vehicle operation during the EV lifecycle highlights the importance of the way in which electricity is made, how efficient energy conversion is, and the way a vehicle is used; and
- the source of the electricity used to power electric vehicles is a key issue in Victoria. Although the breakeven point in terms of carbon emissions from vehicle operation is some years away for vehicles operating on Victoria's current electricity grid, an electric vehicle operating on renewable energy may provide a net benefit in terms of lifecycle carbon emissions within three years of operation.

Figure 1 of the EV Trial Report (below) depicts the interrelationship between EV energy economy and electricity grid emissions intensity, which in combination determine the vehicle's full fuel cycle greenhouse gas emissions. Using the first-generation Nissan LEAF as a case study, the EV Trial Report modelled how the vehicle's full fuel cycle emissions (horizontal dashed line) trend away from high emissions (signified by the blue shaded area) towards low emissions (signified by the green shaded area) as the grid decarbonises.

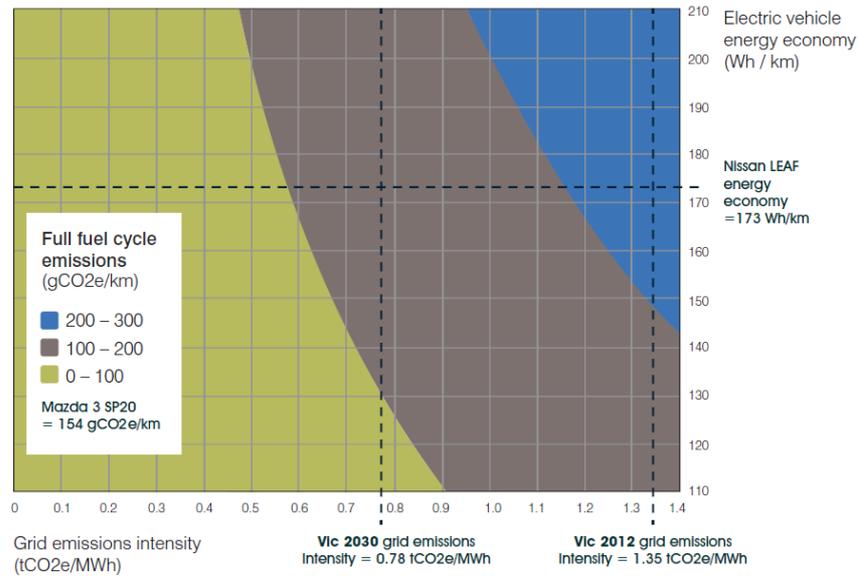


Figure 1. Chart depicting the interrelationship between EV energy economy and electricity grid emissions intensity

Figure 2 of the EV Trial Report (below) depicts the cumulative greenhouse gas emissions calculated over an average vehicle lifetime for an Internal Combustion Engine Vehicle (ICEV) and a comparable EV operating on both the Victorian electricity grid mix and renewable energy. The step change in both EV calculations reflects impacts arising from a single battery replacement forecast, however more recent data suggests this may not be required. We also consider that grid emissions impacts will decrease over time, meaning that a vehicle purchased later than 2012 will have lower overall emissions.

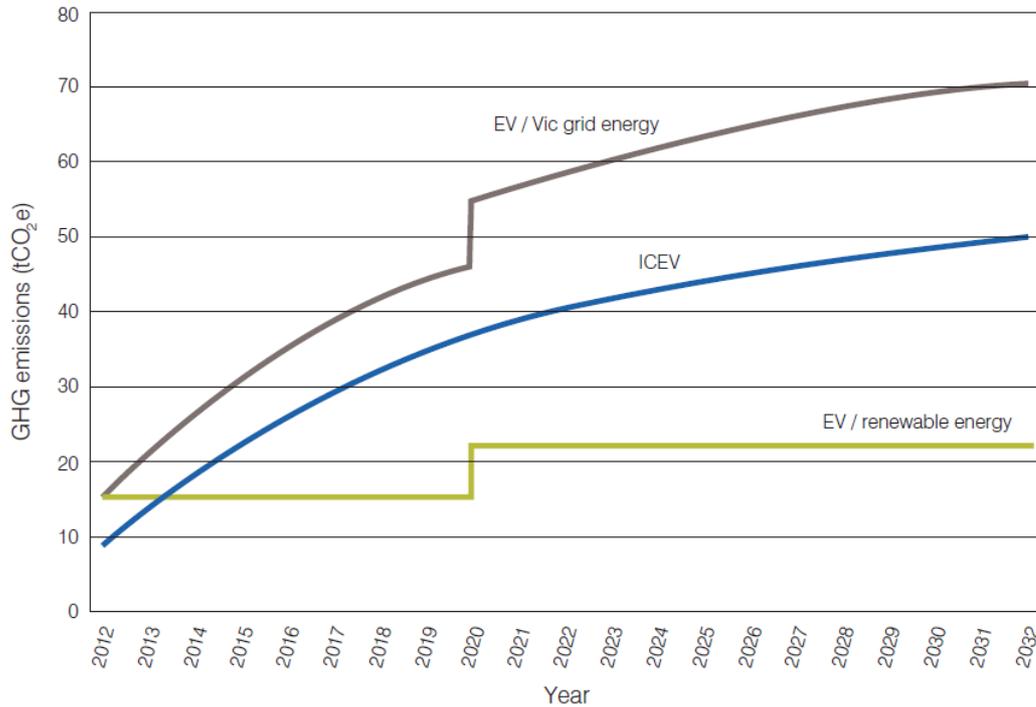


Figure 2. Cumulative GhG emissions calculated over an average vehicle lifetime for an ICEV and a comparable EV operating on both the Victorian electricity grid mix and renewable energy

AGL is acutely aware of the potential for electricity generation to facilitate emissions reductions in the transportation sector, through electrification powered by renewable energy as is illustrated by these figures.

AGL is committed to playing a leading role in developing a pathway to a modern, decarbonised generation sector, as our Greenhouse Gas Policy elaborates. We also developed our Electric Car Plan with a strategic focus on its environmental impacts, as the energy grid transitions towards full decarbonisation. AGL’s Electric Car Plan for EV charging at home is 100 per cent carbon offset through our Future Forest Program, effectively delivering zero emission charging to our EV customers. Our Future Forests Program enables customers to offset the carbon emissions associated with their electricity usage through Australian forestry carbon credits certified against the Gold Standard. This program is underpinned by robust accounting to ensure its integrity. Whilst retailers currently offer a number of alternative carbon offset programs, in our view, the Gold Standard provides the most robust certification standard globally, ensuring that energy efficiency and renewable energy projects actually reduce carbon dioxide emissions, and provide benefits to the local population.

AGL is also committed to ensuring robust product stewardship and recycling of batteries, as their use becomes more widespread in both the electricity and transport sectors. In particular, AGL is a member of the Australian Battery Recycling Initiative (**ABRI**), a not-for-profit association established in 2008 to promote responsible environmental management of batteries at end of life. AGL has been working closely with ABRI and other stakeholders to develop robust product stewardship and recycling processes and standards for the Australian market.



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AGL appreciates that the transition towards automated and zero emission technology vehicles will have substantial implications for Victoria's electricity grid with flow-on effects for infrastructure. In particular, we consider that the transition will require careful consideration of charging management and system optimisation in order to address the risks and realise the full benefits of EV uptake. We elaborate further on these issues in our recent submission to Infrastructure Victoria.<sup>14</sup>

AGL considers that the Victorian Government could play an integral role in addressing charging options outside of the home through the planning and deployment of charging infrastructure. Concerted State policy on EV infrastructure planning and deployment would greatly assist in addressing (perceived) EV range limitations and extended zero emissions vehicle operation. AGL recognises that at the early stages of the EV market in Australia, fast charging infrastructure is likely to present a challenging business model for private sector investment. This is because fast charging infrastructure addresses only an occasional need for EV owners, without necessarily capturing the indirect value of EV charging services. Accordingly, we would urge the Victorian Government to consider way in which to facilitate private sector infrastructure investment. Planning and support for charging infrastructure will help to ensure an economically efficient approach to EV uptake.

Having regard to the matters discussed above, we would also recommend that the Victorian Government consider designing an EV charging roadmap based on expected uptake scenarios with allocated tasks and responsibilities in partnership with the private sector.

### **The use of interstate and international offsets to meet Victoria's interim targets**

As AGL observed in its recent submission to the Climate Change Authority<sup>15</sup>, public policy on carbon markets should carefully balance the use of carbon markets and offsets to ensure that reliance on these avenues does not defer decarbonisation, exposing the Australian economy to greater structural shock in the future should "deep cuts" be required.<sup>16</sup>

As the Paris Agreement rules on carbon markets evolve, international linkages have the potential to enable Australian businesses to optimise the cost of abatement. Accordingly, policymakers should also consider ways in which to develop Australia's domestic carbon market and link it to key international markets. Nevertheless, it is imperative that public policy effectively manage the risks associated with the use of offsets and carbon credits by limiting the volume of international permits and credits and only allowing the use of robust sources of international permits and credits.

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<sup>14</sup> See AGL, Submission to Infrastructure Victoria on automated and zero emission vehicle infrastructure (7 March 2018), Available at <http://aglblog.com.au/2018/03/submission-to-infrastructure-victoria-on-automated-and-zero-emission-vehicle-infrastructure/>

<sup>15</sup> AGL, Submission to the Review of the Carbon Farming Initiative Legislation and the Emissions Reduction Fund, Available at <http://aglblog.com.au/2017/09/submission-to-the-review-of-the-carbon-farming-initiative-legislation-and-the-emissions-reduction-fund/>.

<sup>16</sup> See further Tim Nelson, 'Australian Climate Change Policy – Where to From Here?' (2015) *Economic Papers*.